# CITY of BEAVERTON

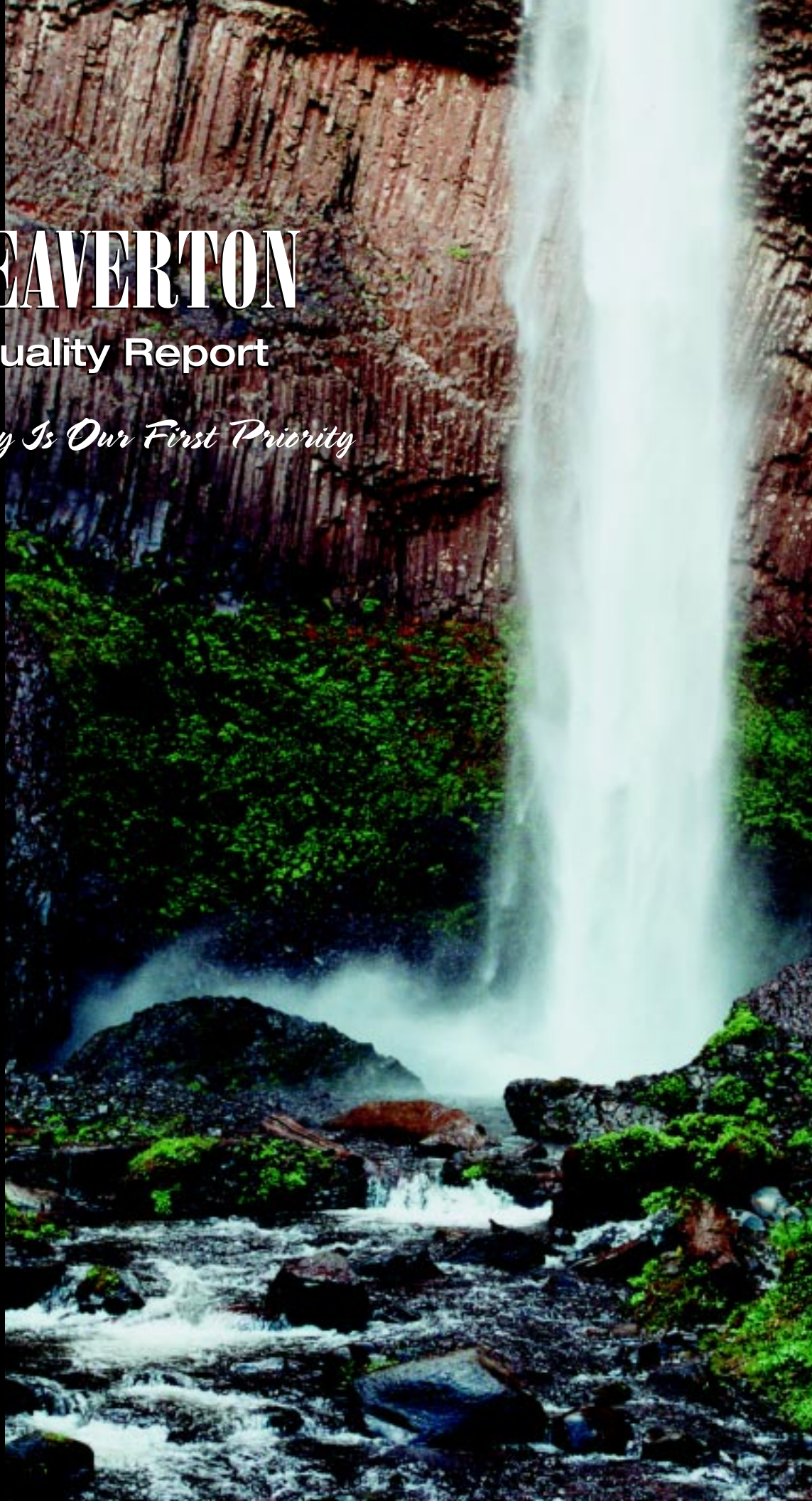
## 2000 Water Quality Report

### *Your Water Quality Is Our First Priority*

The City of Beaverton is pleased to provide you with this year 2000 Water Quality Report. The purpose of the report is to (1) provide you with information about your drinking water, and (2) to comply with U.S. Environmental Protection Agency (EPA) reporting requirements. Using data collected during 2000, we have summarized information about your water supply sources, water facilities that deliver water to your tap, and the quality of your drinking water. We also are taking this opportunity to present additional information about other programs underway that are helping to assure you have safe and dependable drinking water.

**The City of Beaverton is proud of its quality water supply, which meets or exceeds all federal and state water quality requirements. If you have any questions regarding your water quality or about information presented in this report, please call us at 503-350-4017.**

Si Habla Espanol: Este informe contiene informacion muy importante. Traduscalo o hable con un amigo quien lo entienda bien.



## Details About Your Water System

The City of Beaverton supplies water to about 80 percent of the 77,050 residents who live within the City limits. The remaining 20 percent, or approximately 15,937 Beaverton residents, are supplied water by the Tualatin Valley Water District (TVWD), West Slope Water District, and Raleigh Water District. The City of Beaverton Water Division maintains 219 miles of various sizes of distribution system piping, and 2,125 fire hydrants.

## Source of Water

The City is a member of the Joint Water Commission (JWC), an intergovernmental group whose members include Beaverton, Hillsboro, Forest Grove, and the TVWD. The JWC was formed to store, manage and treat water for its customers. As a resident of Beaverton, your water is supplied primarily by the JWC. The sources of JWC water are the Tualatin and Trask River watersheds located in the Coast Range.

**SAFE DRINKING WATER HOTLINE**

Drinking water, including bottled water, may reasonably be expected to contain at least small amounts of some contaminants. The presence of contaminants does not necessarily indicate that water poses a health risk. More information about contaminants and potential health effects can be obtained by calling the Environmental Protection Agency's Safe Drinking Water Hotline **(800-426-4791)**.

In the winter and spring when ample stream flow is available, the City uses its surface water right to obtain water from the Tualatin River. Raw water is pumped from the nearby Tualatin River to the JWC treatment plant (located south of Forest Grove). The treatment plant filters and treats the water so that it meets federal drinking water standards.

The City also owns the right to store raw water (before treatment) in Henry Hagg Lake (Scoggins Reservoir) and Barney Reservoir. During the summer when water demand is high and the Tualatin River is low, water stored in Henry Hagg Lake and Barney Reservoir is released into the Tualatin River upstream for eventual withdrawal and treatment for drinking water. Water released from Henry Hagg Lake and Barney Reservoir supply most of Beaverton's raw water during the summer. This process helps maintain minimum stream flows in the Tualatin River, which is critical to sustaining a healthy river ecosystem. Water released from Barney Reservoir is diverted through a short pipeline across a narrow Coast Range divide into the headwaters of the Tualatin River. Water released from Henry Hagg Lake travels by way of Scoggins Creek to the Tualatin River. Water is then withdrawn from the Tualatin River and pumped to the JWC water treatment plant. The City is also participating with other westside cities in evaluating the potential water storage expansion of Henry Hagg Lake. Preliminary studies are underway to evaluate the feasibility of increasing the storage capacity of the Hagg Lake reservoir by 16.5 billion gallons (50,600 acre-feet) to meet future demands by raising the Scoggins Dam by 40 feet.

**WHAT'S AN ACRE-FOOT?**

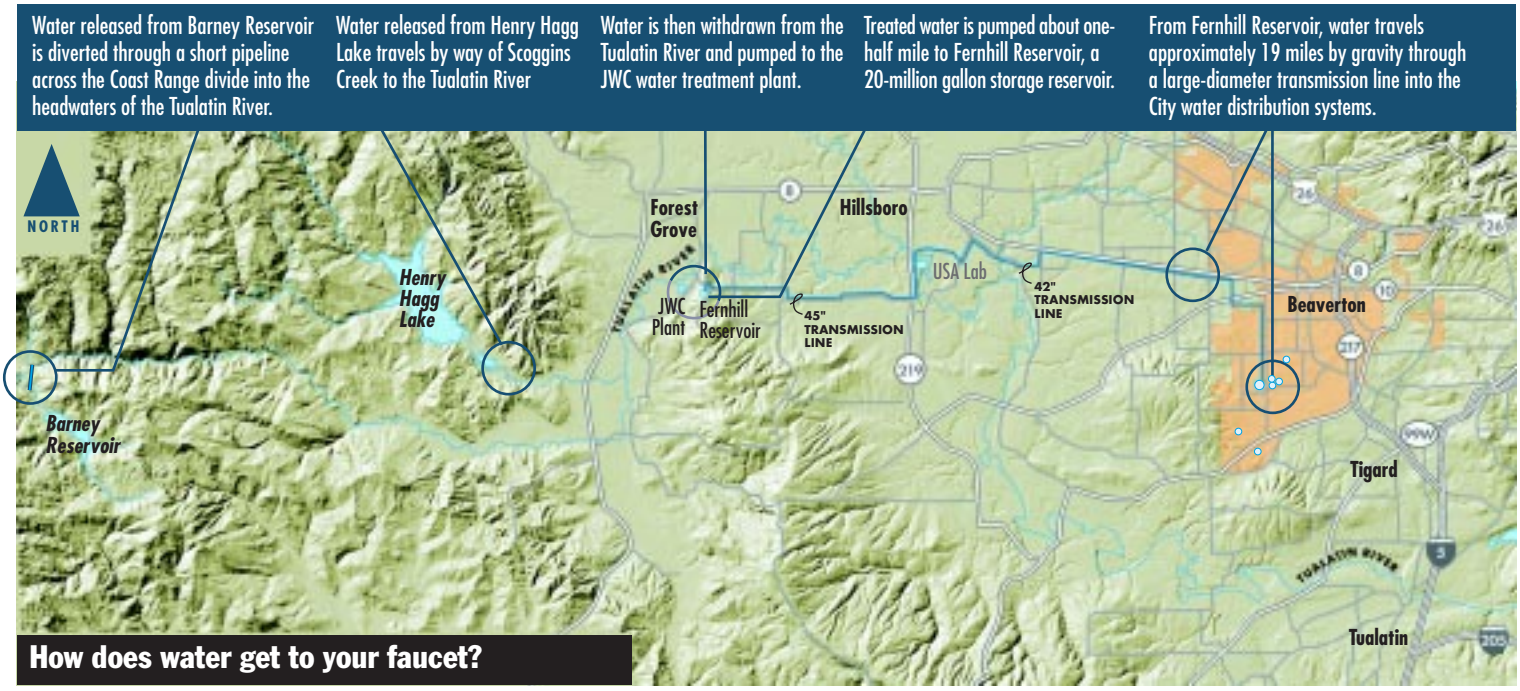
1 acre-foot (ac-ft) = 325,850 gallons = 1 foot of standing water on an acre of land.

The JWC water treatment plant has a peak capacity of 70 million gallons of finished drinking water per day. Drinking water produced by the JWC water treatment plant is pumped about one-half mile to Fernhill Reservoir, a 20-million-gallon concrete storage reservoir. From Fernhill Reservoir, water travels approximately 19 miles by gravity through a large-diameter transmission line into the City's water distribution system, which consists of two terminal storage reservoirs and 219 miles of water distribution piping. Terminal storage reservoirs in Beaverton hold a total of 20 million gallons and are owned and operated by the City.

## Water Storage — Do We Have Enough?

The City of Beaverton owns the right to store raw water (water before it's filtered) in Barney Reservoir and Henry Hagg Lake. Recently, we participated in the expansion of Barney Reservoir by purchasing a 21.5 percent ownership, and by acquiring the right to buy an additional 1,700 ac-ft in the future for a total of 5,414 ac-ft of useable water. The term useable means the net amount available after natural losses from evaporation, ground absorption, mandated releases into the river for fish and wildlife, and operational losses in the dams. We also own 3,920 useable ac-ft in Henry Hagg Lake. These two impoundments

*From left to right: Barney Reservoir, Henry Hagg Lake, Joint Water Commission's Water Treatment Facility*




total 9,334 ac-ft (about 3.0 billion gallons) of usable stored raw water. This water is needed during the summer months when we cannot draw on our wet-season natural stream water rights on the Tualatin River. Our wet season (winter) water right on the Tualatin River is 16.2 million gallons per day (mgd). To give you some perspective, our average daily water consumption for 2000 was 9.07 mgd, with a high of 16.9 mgd. We're currently pursuing other alternatives to help meet increased water demand, such as water conservation and Aquifer Storage and Recovery (ASR).

## What About Backup Supplies For Peak Periods?

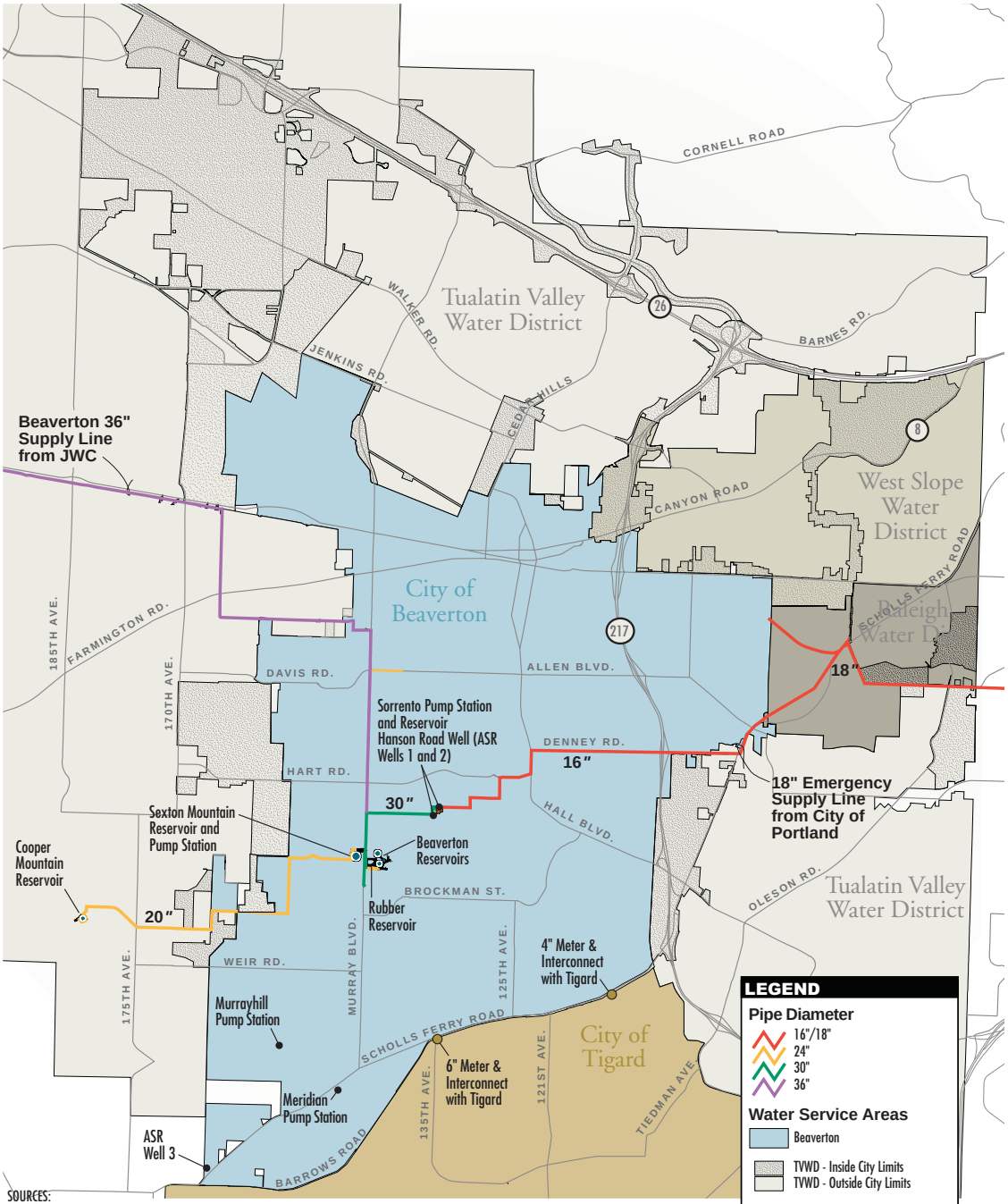
The City of Beaverton can also pump groundwater from its Hanson Road well during peak demands. The City has completed a second water well (ASR No. 2) near the Hanson Road well (ASR No. 1) that can pump groundwater too, and a third one is planned on Loon Drive near the intersection of SW Scholls Ferry Road and SW Barrows Road; the new wells will primarily be used for ASR, which is discussed later. The Hanson Road well (drilled in 1946) was retrofitted to operate as an ASR facility in 1997.

## Aquifer Storage and Recovery, Project Update

Perhaps you remember from last year's Water Quality Report that the City of Beaverton has been testing the use of ASR at the Sorrento Water Works site, located at SW 136th Avenue and Hanson Road in Beaverton. ASR is defined as the storage of water in a water-bearing zone, or aquifer, and the recovery of that water out of a well when the water is needed. Typically, water is stored in aquifers during the winter, when supply is plentiful. During the summer, when demand runs high, the water is recovered. This system is beneficial in a number of ways. For example, it can help us to meet future water demands and may postpone the need to purchase water from other sources. The ASR wells can be used to supply water during times of emergency when water supply through the long transmission line may be interrupted, such as during a power outage, flood, or pipeline rupture.

The aquifer at the Sorrento Water Works site consists of horizontal fractured rock and rubble zones located between individual basalt flows. Drinking water supplied by the JWC treatment plant is injected into the horizontal zones for storage. On recovery, the water looks and tastes aesthetically pleasing. In contrast, native groundwater contains minerals that create a harder taste. Native groundwater is normally blended with softer, JWC-treated water. Last year, approximately 60 million gallons of JWC drinking water were injected into the Hanson Road well and pumped back into the City's distribution system. The recovered ASR water met all federal drinking water standards. As part of the testing program, the Oregon Water Resources Department, Oregon Health Division, and Oregon Department of Environmental Quality assisted us in reviewing ASR test data. Last year's testing program was a success. The 60 million gallons of drinking water recovered from the well represented about 2 percent of the 3 billion gallons distributed to City customers in 2000.

In addition, approximately 60 million gallons of native groundwater was pumped from the Hanson Road well to help offset peaking demands; this water was also blended with JWC water. Building on last year's success the City has completed construction of its second ASR well located at the Sorrento Water Works facility and a third is expected to be on-line by 2002. The three wells together (Hanson Road [ASR No. 1], ASR No. 2, and No. 3) are projected to supply as much as 360 million gallons of water during the peak summer time season, which represents 10% of the City's annual 3 billion gallon distribution (or up to 20% during summer peaking). The City plans to continue pursuing development of other ASR wells. Final ASR build-out could consist of 4-6 ASR wells supplying 4-6 million gallons of water per day during the dry summer months and emergencies.




SOURCES:
METRO's Regional Land Information System (RLIS) - Current as of February 2000
City of Beaverton Community Development Department - Current as of April 2000

NOTE:
This map represents the best data available at the time of publication. While every effort has been made to insure the accuracy of the information shown on this page, the City of Beaverton assumes no responsibility or liability for any errors or omissions.

We have also completed a preliminary wellhead protection program for the Hanson Road well site (ASR Well No. 1 and ASR Well No. 2). The objective of this program is to protect groundwater from surface contamination. Such protection is critical to the continued growth and health of the surrounding community. City and County planners are currently reviewing the wellhead protection program. Our intent is to implement the program with input from local citizens and business owners.

## What about an Emergency Supply?

The City of Beaverton maintains a total of 28.25 million gallons of in-town stored water in five ground level reservoirs. This water is used for peak days, fire protection and emergencies. Water is distributed to you principally by gravity from City reservoirs. With a current average City water demand of 9.07 million gallons each day, we have more than a 3-day supply of stored water in reservoirs. By

supplementing the emergency demand with ASR water, the City has about a 4.5-day supply assuming a consumption rate of 9.07 million gallons per day. After 4.5 days the City could continue to supply 3 million gallons per day of water to the City using its ASR wells, but any make-up would have to come from other sources as outlined below. Well pumps can be powered using an emergency generator during high summer demand and electrical power outages.



*From left to right:*
*Cooper Mountain Reservoir,*
*Sorrento Pump Station,*
*Sexton Mountain Reservoir*

We also have back-up supply connections with TVWD, City of Portland Bureau of Water Works, and the City of Tigard. In emergency situations, we can open these connections to supplement the JWC supply. The source for these back-up water connections is the City of Portland Bureau of Water Works, which uses a combination of Bull Run surface water and groundwater supplies from the Columbia South Shore Wellfield during high summer demand and emergencies. In 2000, we did not draw on these connections.

## Water System Maintenance

Perhaps you've noticed the construction going on in the downtown area over the last year (including Hall Boulevard, Broadway Street, 5th Street, Lombard Avenue, Watson Avenue, and Short Avenue). Much of the excavation and street patching is due to a water main replacement program. The City of Beaverton Water Division maintains 219 miles of distribution system piping from 4 to 36 inches in diameter, and 2,125 fire hydrants. We have developed an annual program to replace underground water mains when they are undersized, no longer meet current standards, or have reached the end of their useful life. Our objective is to replace water mains by the time they reach about 65 years of age. Over the last several years we have contracted with a leak detection consultant to locate small underground water main leaks that do not show up on the ground surface. The savings are considerable. By repairing these leaks while they are small, emergency call-outs are reduced, property damage is minimized, and water is saved. We have also developed a fire hydrant replacement program. Fire hydrants are replaced using a priority developed in conjunction with Tualatin Valley Fire and Rescue. With these programs we can assure the dependability and integrity of our water distribution system.

*From left to right:*
*Hanson Road Well, South Central Construction*


## Backflow Prevention Valves – What are they and why do we need them?

The City's water distribution system supplies clean, safe drinking water to its residences and businesses through a network of distribution pipes. Once the water is delivered to you through your water meter, certain connections are made to non-potable uses that could contaminate the water you drink. These types of connections are called Cross Connections. Here is a brief list of some of these types of connections:

- Irrigation systems
- Water recirculating systems
- Solar heating systems
- Swimming pools
- Heating systems such as boilers
- Fire systems

In addition, many domestic wells can be indirectly connected to the City's drinking water system through the household plumbing. Water used in these types of applications could become contaminated with chemicals or biological agents and can potentially "backflow" into the City's drinking water system. Many of these connections are necessary, or have become a convenience which we have grown to accept in our daily lives. We can allow these types of connections as long as the proper backflow preven-

**BACK-UP WATER SUPPLY**

During the summer of 2000, the City of Beaverton did not draw on back-up connections with the Tualatin Valley Water District and City of Portland Bureau of Water Works supply to meet demands. The City of Beaverton may seek assistance and draw on its connection with the Tualatin Valley Water District and/or the City of Portland Bureau of Water Works to meet emergencies in the future, should the need arise.

tion assembly is installed. To help you understand what a backflow prevention assembly is, think of the assembly as a one-way street. For example, it allows water to flow into your irrigation system, but it will not allow water from the irrigation system, which may contain lawn chemicals, to flow back into your drinking water or the City's pipes.

**IMPORTANT HEALTH INFORMATION**

Some people may be more vulnerable to contaminants in drinking water than the general population. Immuno-compromised people such as people with cancer undergoing chemotherapy, people who have undergone organ transplants, people with HIV/AIDS or other immune system disorders, the elderly, and infants can be particularly at risk from infections. These people should seek advice about drinking water from their health care providers. EPA/CDC guidelines on appropriate means to lessen the risk of infection by *Cryptosporidium* and other microbial contaminants are available from the Safe Drinking Water Hotline (800-426-4791).

City, State, and Federal regulations require backflow prevention assemblies to be installed on new plumbing systems where a cross connection exists. All plumbing work, or connections to an existing plumbing system require a permit and inspection by a plumbing inspector. These same State regulations require that the backflow assemblies have an annual performance test by a certified tester.

Over the years, many plumbing systems and sprinkler systems were installed without a permit, or without the knowledge that a backflow prevention assembly was needed. The City is working hard to determine how many systems are installed that could potentially backflow non-potable water back into the City's drinking water system. Early results from a City field survey indicate that about 15 percent of all the single-family residences in Beaverton may require a backflow prevention assembly and of those, about 30 percent are now in compliance. So get involved and have your irrigation systems "checked out" by either the City or a qualified contractor, and do your part to protect our drinking water system. To find out more about cross connections, or backflow prevention, please visit our website at www.ci.beaverton.or.us, or call our Cross Connection Inspector at 503-350-4042.

*Conserving water will help maintain a healthy river eco-system.*

## Water Conservation — What Can I Do?

Although we live in a state that has 296 miles of coastline, 1,769 lakes, 2,862 miles of rivers, 1,229 square miles of water and receives ample rain on the west side, we still need to conserve water. The main reasons: rain, although plentiful, falls mostly during the winter — Oregon has fairly dry summers, and keeping minimum stream flows during those dry months is critical to maintaining a strong river eco-system and a healthy fish habitat. Here are some ways you can conserve water:

- Consider installing an Ecolawn — it consists of a unique set of plants (e.g., perennial ryegrass) that require less water and less mowing. The average lawn owner uses between 9,000 and 13,000 gallons of water per day in the summer, which is roughly equivalent to running four full loads of laundry every day during the summer. Consult with your favorite landscape specialists to revamp your lawn into an environmentally friendly lawn — consider the same for your shrubs. Also don't soak your lawn — water about 1-inch once a week (twice if it's very hot) and water infrequently, but thoroughly so moisture soaks down to the roots. Water early in the morning or late in the evening to avoid evaporation. Did you know that up to 30% of a home's water use is used for landscape irrigation in the summer?
- The bathroom is where most of the water is used in a typical home (28%). A family of four could save almost 20,000 gallons of water each year with an ultra low-flush toilet. The same family could save an additional 19,000 gallons of water each year by installing a water-efficient showerhead.
- Wash full loads in your washing machine and save 20 gallons per load. Did you know that the second biggest water guzzler in your house is the washing machine (22%), whereas the dishwasher represents only 3% of a typical household water use — that doesn't mean that you shouldn't run your dishwasher full too.
- Check for leaks — toilet leaks are the most common (i.e., 50 gallons per day can be lost) and they are often silent. Consider installing a toilet flush system that detects leaks, they're available at your local plumbing store.
- Use a broom instead of a hose to clean decks and driveways and wash your car with a bucket, sponge and shut-off valve on your hose. A free flowing hose uses up to 300 gallons per hour.

## 2000 Water Quality Monitoring Results

The US EPA requires all water utilities to monitor for all regulated compounds. The table below summarizes the detected compounds in the City of Beaverton water supply. All of the detections fell below the maximum contaminant level set by the federal and state agencies. Not listed in the table are 67 compounds that were not detected. The water supplied to the City of Beaverton is tested at the wells, at the post-treatment process, in the distribution system, and at the tap. The City of Beaverton is proud of its water supply, which meets or exceeds all federal and state water quality requirements.

**The following terms are used to summarize the sampling detects:**

**Maximum contaminant level (MCL):** The highest level of a contaminant that is allowed in drinking water. MCLs are set as close to the MCLGs as feasible using the best available treatment technology.

**Maximum contaminant level goal (MCLG):** The level of a contaminant in drinking water below which there is no known or expected risk to health. MCLGs allow for a margin of safety.

**Treatment Technique (TT):** A required process intended to reduce the level of a contaminant in drinking water.

**Action Level (AL):** The concentration of a contaminant which, if exceeded, triggers a treatment or other requirement for a water system to follow.

**The following units appear throughout the table:**

**NTU:** Nephelometric Turbidity Units

**ppm:** parts per million, or milligrams per liter (mg/L)

**ppb:** parts per billion, or micrograms per liter (µg/L)

**pCi/l:** picocurries per liter, a standard measurement of beta particles in water

**Lead:** Infants and young children are typically more vulnerable to lead in drinking water than the general population. It is possible that lead levels at your home may be higher than at other homes in the community as a result of materials used in your home's plumbing. If you are concerned about elevated lead levels in your home's water, flush your tap for 30 seconds to 2 minutes before using tap water. If you wish to have your water tested or would like additional information, call the Safe Drinking Water Hotline (800-426-4791).

**Additional Water Quality Information**

The sources of drinking water (both tap water and bottled water) include rivers, lakes, streams, ponds, reservoirs, springs, and wells. As water travels over the surface of the land or through the ground, it dissolves naturally occurring minerals and, in some cases, radioactive material, and can pick up substances resulting from the presence of animals or from human activity.

**Contaminants that may be present in the water include:**

- Microbial contaminants, such as viruses and bacteria, which may come from sewage treatment plants, septic systems, agricultural livestock operations, and wildlife.
- Inorganic contaminants, such as salts and metals, which can be naturally occurring or result from urban storm runoff, industrial or domestic wastewater discharges, oil and gas production, mining, or farming.
- Pesticides and herbicides, which may come from a variety of sources such as agriculture, urban stormwater runoff, and residential uses.
- Organic chemical contaminants, including synthetic and volatile organic chemicals, which are by-products of industrial processes and petroleum production, and can also come from gas stations, urban stormwater runoff, and septic systems.
- Radioactive contaminants, which can be naturally occurring or result from oil and gas production and mining activities.

In order to ensure that tap water is safe to drink, EPA prescribes regulations which limit the amount of certain contaminants in water provided by public water systems. Food and Drug Administration (FDA) regulations establish limits for contaminants in bottled water to provide the same protection for public health.

## Primary Supply

Sources: JWC Treatment Plant and Hanson Road Well Water (Recovered ASR Water and Native Groundwater)

| Contaminants | Lowest Detection Level | Highest Detection Used for Compliance | Highest Level Allowed (MCL) | Ideal Goals (MCLG) | Major Sources in Drinking Water |
|---|---|---|---|---|---|
| **Microbiological Contaminants** | | | | | |
| Total Coliform Bacteria | ND | ND | Must not detect coliform bacteria in more than 5 percent of monthly samples | 0 | Naturally present in the environment |
| Turbidity[1] | 0 NTU | 0.04 NTU | TT | NA | Soil runoff |
| **Inorganics** | | | | | |
| Barium | ND | 200 ppb | 2000 ppb | 2000 ppb | Discharge from metal refineries; erosion of natural deposits; discharge of drilling wastes |
| Copper | ND | 11 ppb | AL=1,300 ppb | 1,300 ppb | Corrosion of household plumbing systems; Erosion of natural deposits; Leaching from wood preservatives. |
| Chromium | ND | 2 ppb | 100 ppb | 100 ppb | Discharge from steel and pulp mills and plating operations; erosion of natural deposits |
| Nitrate (as Nitrogen) | ND | 0.8 ppm | 10 ppm | 10 ppm | Runoff from fertilizer use; leaching from septic tanks, sewage; erosion of natural deposits |
| Fluoride | ND | 0.08 | 4 ppm | 4 ppm | Erosion of natural deposits; discharge from fertilizer and aluminum plants |
| Radon[2] | | | | | |
| Gross Alpha | 1 pCi/l | NA | 50[3] | NA | Erosion of natural deposits |
| Gross Beta | 3.7 pCi/l | NA | 50[3] | NA | Decay of natural and man-made deposits |
| **Volatile Organic Contaminants** | | | | | |
| TTHMs (Total trihalomethanes)[4] | | | | | Byproducts of drinking water chlorination |
| Annual rolling average | | | | | |
| of all sites | 28 ppb | 34 ppb | 80 ppb[5] | NA | |
| At any one site | 3.8 ppb | 59 ppb | | NA | |
| HAAs (total haloacetic acids)[6] | | | | | Byproducts of drinking water chlorination |
| Annual rolling average | | | | | |
| of all sites | 25 ppb | 34 ppb | 60 ppb | NA | |
| At any one site | 17 | 65 ppb | | NA | |
| **Regulated at the Customer's Tap** | | | | | |
| Copper[7] | No sites exceeded the Action Level | 0.024 ppm | AL = 1.3 ppm | 1.3 ppm | Corrosion of household plumbing systems; erosion of natural deposits; leaching from wood preservatives |
| Lead[7] | Less than 10 percent of samples exceeded the Action Level | 5.0 ppb | AL = 15 ppb | 0 ppb | Corrosion of household plumbing systems; erosion of natural deposits |

[1] Data provided by the Joint Water Commission.

[2] One-time sampling event at Hanson Road Well (ASR No. 1)

[3] EPA considers 50 pCi/l to be the level of concern for beta particles.

[4] Total trihalomethanes are disinfection byproducts from the breakdown of chlorine compounds added by the City for disinfection.

[5] MCL effective in 2001.

[6] Haloacetic Acids are disinfection byproducts from the breakdown of chlorine compounds added by the City for disinfection.

[7] Lead and copper data from 1998 sampling. The City of Beaverton was not required to sample for lead and copper in 2000 because of past compliance of the system.

ND = Not detected
NA = Not applicable

**...IF YOU HAVE QUESTIONS...**

If you have any questions regarding water quality or about information presented in this report, please call us at **503-350-4017**.

**City of Beaverton**
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